

CLAIMS

What is claimed is:

- 1 1. A method for preparing a region of an electronic document for printing on a printing
2 system having asymmetric misregistration behavior, comprising:
3 trapping the region asymmetrically to compensate for asymmetric misregistration
4 behavior of the printing system.

1 2. The method of claim 1, wherein the region is an entire page or a portion of a page
2 represented in a page description language.

1 3. The method of claim 1, wherein the region is an entire page or a portion of a page
2 represented as a raster.

- 1 4. The method of claim 1; further comprising:
2 defining an asymmetric transformation;
3 applying the asymmetric transformation to the region to generate a transformed
4 region;
5 processing the transformed region to generate transformed traps; and
6 applying an inverse transformation to the transformed traps to generate traps for the
7 region, the inverse transformation being an inverse of the asymmetric transformation.

- 1 5. The method of claim 4, wherein the asymmetric transformation is defined as a
2 transformation matrix and the inverse transformation is defined as a matrix inverse of the
3 transformation matrix.

1 6. The method of claim 4, wherein defining the asymmetric transformation comprises:

2 obtaining a first trap width magnitude and direction, the first trap width being a
3 minimum trap width for the printing system;

4 obtaining a second trap width magnitude and direction, the second trap width being a
5 maximum trap width for the printing system;

6 defining a rotational component of the asymmetric transformation by determining an
7 angle by which a first axis of a device space has to be rotated to be aligned with the first trap
8 width direction; and

9 defining a scaling component of the asymmetric transformation according to a ratio of
10 the first trap width magnitude and the second trap width magnitude.

1 7. The method of claim 6, wherein the electronic document is represented in a page

2 description language in a user space and the traps for the region are represented in a device
3 space, the method further comprising:

4 mapping the traps from device space to user space and adding the mapped traps to the
5 page description language representation of the electronic document.

1 8. The method of claim 6, wherein the first trap width direction and the second trap width
2 direction are at right angles to each other.

1 9. The method of claim 6, wherein defining the asymmetric transformation maps a first trap
2 width vector and a second trap width vector to orthonormal basis vectors of a trap-engine
3 space.

1 10. The method of claim 4, wherein processing the transformed region to generate
2 transformed traps is done by a trap engine generating symmetric traps in a trap-engine space.

1 11. The method of claim 4, wherein the step of applying the inverse transformation maps the
2 transformed traps from a trap-engine space to a device space.

1 12. The method of claim 4, wherein the electronic document is represented in a page
2 description language in a user space and the traps for the region are represented in a device
3 space, the method further comprising:

4 mapping the traps from device space to user space and adding the mapped traps to the
5 page description language representation of the electronic document.

1 13. The method of claim 4, wherein:

2 the asymmetric transformation maps a resolution-independent representation of the
3 region into a resolution-independent representation of the transformed region;

4 a vector-based trapping engine processes the transformed region to generate
5 transformed traps represented as vectors; and

6 the inverse transformation maps the transformed traps represented as vectors to a
7 device space.

1 14. The method of claim 13, further comprising performing pecker detection and removal in
2 device space before applying the asymmetric transformation.

1 15. A computer program product, tangibly stored on a computer-readable medium, for
2 preparing a region of an electronic document for printing on a printing system having
3 asymmetric misregistration behavior, comprising instructions operable to cause a computer
4 to:

5 trap the region asymmetrically to compensate for asymmetric misregistration behavior
6 of a printing system.

1 16. The product of claim 15, wherein the region is an entire page or a portion of a page
2 represented in a page description language.

1 17. The product of claim 15, wherein the region is an entire page or a portion of a page
2 represented as a raster.

1 18. The product of claim 15, further comprising instructions to:

2 define an asymmetric transformation;

3 apply the asymmetric transformation to the region to generate a transformed region;

4 process the transformed region to generate transformed traps; and

5 apply an inverse transformation to the transformed traps to generate traps for the
6 region, the inverse transformation being an inverse of the asymmetric transformation.

1 19. The product of claim 18, wherein the asymmetric transformation is defined as a
2 transformation matrix and the inverse transformation is defined as a matrix inverse of the
3 transformation matrix.

1 20. The product of claim 18, wherein the instructions to define the asymmetric
2 transformation comprise instructions to:

3 obtain a first trap width magnitude and direction, the first trap width being a
4 minimum trap width for the printing system;

5 obtain a second trap width magnitude and direction, the second trap width being a
6 maximum trap width for the printing system;

7 define a rotational component of the asymmetric transformation by determining an
8 angle by which a first axis of a device space has to be rotated to be aligned with the first trap
9 width direction; and

10 define a scaling component of the asymmetric transformation according to a ratio of
11 the first trap width magnitude and the second trap width magnitude.

1 21. The product of claim 20, wherein the electronic document is represented in a page
2 description language in a user space and the traps for the region are represented in a device
3 space, the product further comprising instructions to:

4 map the traps from device space to user space and add the mapped traps to the page
5 description language representation of the electronic document.

1 22. The product of claim 20, wherein the first trap width direction and the second trap width
2 direction are at right angles to each other.

1 23. The product of claim 20, wherein defining the asymmetric transformation maps a first
2 trap width vector and a second trap width vector to orthonormal basis vectors of a trap-engine
3 space.

1 24. The product of claim 18, wherein processing the transformed region to generate
2 transformed traps is done by a trap engine generating symmetric traps in a trap-engine space.

1 25. The product of claim 18, wherein the step of applying the inverse transformation maps
2 the transformed traps from a trap-engine space to a device space.

1 26. The product of claim 18, wherein the electronic document is represented in a page
2 description language in a user space and the traps for the region are represented in a device
3 space, the product further comprising instructions to:
4 map the traps from device space to user space and add the mapped traps to the page
5 description language representation of the electronic document.

1 27. The product of claim 18, wherein:
2 the asymmetric transformation maps a resolution-independent representation of the
3 region into a resolution-independent representation of the transformed region;
4 a vector-based trapping engine processes the transformed region to generate
5 transformed traps represented as vectors; and
6 the inverse transformation maps the transformed traps represented as vectors to a
7 device space.

1 28. The product of claim 27, further comprising performing pecker detection and removal in
2 device space before applying the asymmetric transformation.

1 29. A system for preparing a region of an electronic document for printing, comprising:
2 a printing system having asymmetric misregistration behavior; and
3 means for trapping the region asymmetrically to compensate for the asymmetric
4 misregistration behavior of the printing system.

1 30. The system of claim 29, further comprising:
2 means for obtaining a minimum trap width and a maximum trap width defining the
3 asymmetric misregistration behavior of the printing system.